



Hands-on Activity: The SOHO/LASCO CME Catalog

Nat Gopalswamy, NASA/GSFC, Greenbelt, MD 20771, USA

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SOHO/LASCO CME Catalog

Website: https://cdaw.gsfc.nasa.gov/CME_list/index.html

The SOHO/LASCO CME catalog contains all CMEs manually identified since 1996.

The catalog is web based and fully searchable with plots, movies, and measured parameters of CMEs

Details:

https://cdaw.gsfc.nasa.gov/CME_list/catalog_description.htm


Top Level

The CME catalog is arranged as an *YEAR X MONTH* Matrix. Each matrix element is a link to all the CMEs identified in the corresponding month

YEAR	MONTH											
1996	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1997	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1999	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2002	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2005	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	Jan	Feb	Mar	Apr	May							

- Click on month to get the list of CMEs for that month
- [A complete description of the catalog](#)
- [Text only version](#)
- [Search the entire catalog](#)
- [Related Links](#)

Index of /CME_list/UNIVERSAL/text_ver

Name	Last modified	Size	Description
 Parent Directory	20-Mar-2006 14:34	-	
 univ1996_01.txt	11-Jan-2006 14:18	1k	
 univ1996_02.txt	11-Jan-2006 14:18	1k	

Monthly List

The monthly list is a 13-column html table containing the basic measurements movies, and plots for each CME identified in a given month.

- CME heights (with respect to the disk center) are measured at the fastest segment of the leading edge.
- PA= Position Angle measured from Solar North in degrees (counter-clockwise)
- Halo CMEs are indicated in the "Central PA" column. The letters ("S", "BA", "CA") in the brackets show type of halo CMEs. [See examples.](#)
- Click on date to view Java script movie of the CME.
- Click on time to see height-time measurements as a text file.
- Click on speed to view height-time plots of the CME.
- Beware of data gaps. Check for LASCO/C2 data gaps [here](#).
- [A complete descriptor of the catalog](#)
- Click [here](#) to search the entire catalog.

LASCO C2 downtimes

2005/08/08 17:46 - 2005/08/08 21:42

2005/08/09 20:42 - 2005/08/10 00:40

Links to daily movies at NRL site

First C2 Appearance Date Time [UT]	Central PA [deg]	Angular Width [deg]	Linear Speed [km/s]	2nd-order Speed at final height [km/s]	2nd-order Speed at 20 Rs [km/s]	Accel [m/s ²]	Mass [gram]	Kinetic Energy [erg]	MPA [deg]	Daily Movies and Plots	Remarks
2005/08/01 12:54:05	104	32	463	181	0	-1:4.1 ^{*1}	----	----	99	C2 C3 195 FHTX DST Java Movie	Only 3 points
2005/08/01 14:30:21	83	93	984	1128	1065	17.9	----	----	68	C2 C3 195 FHTX DST Java Movie	

Plots of SEPs and Dst to check SEP effectiveness, geoeffectiveness and flare association

C2, C3 Java movies (direct and differenced) with superposed EIT 195 images; movies comparing CMEs with Wind/WAVES radio bursts & X-ray flares

Exercise 1

- Look at all CMEs observed in one month, say, May 2005:
- https://cdaw.gsfc.nasa.gov/CME_list/UNIVERSAL/2005_05/univ2005_05.html
- Look at a Particular CME: 2005/05/13 at 17:12:05
- Click on all the links on this row. e.g., the first column gives the LASCO/C2 movie on the left and GOES soft X-ray flare on the right:
https://cdaw.gsfc.nasa.gov/movie/make_javamovie.php?stime=20050513_1554&etime=20050513_1842&img1=lasc2rdf&title=20050513.171205.p002s;V=1689km/s
- There are many different combinations of movies
- Measured attributes of CMEs (speed, width, central position angle, ...)

Exercise 1

- Click on PHTX under “daily movies” column to see solar energetic particle events:
- https://cdaw.gsfc.nasa.gov/CME_list/daily_plots/sephtx/2005_05/sephtx_20050513.png
- Click on Dst under “daily movies” column to if there were any geomagnetic storms:
- https://cdaw.gsfc.nasa.gov/CME_list/daily_plots/dsthtx/2005_05/dsthtx_20050513.html
- Explain why the onset times of SEP event and the geomagnetic storm are different

Special Event Catalogs

- Halo CME Catalog:
 - https://cdaw.gsfc.nasa.gov/CME_list/halo/halo.html
- Catalog of CMEs with Type II Bursts:
 - https://cdaw.gsfc.nasa.gov/CME_list/radio/waves_type2.html
- Catalog of large SEP Events:
 - https://cdaw.gsfc.nasa.gov/CME_list/sepe/

Exercise 2

Count the number of CMEs in the following intervals using the search engine and compare them:

- | | |
|---------------------|--------------------|
| • Cycle 23 | Cycle 24 |
| • 5/1996 to 12/1998 | 12/2008 to 11/2011 |
| • 1/1999 to 5/2002 | 12/2011 to 01/2015 |
| • 6/2002 to 11/2008 | 2/2015 to 10/2017 |

Exercise 3 Halo CMEs

- Count the number of halo CMEs in cycles 23 and 24:
- 5/1996 to 3/2005 & 12/2008 to 10/2017
- What do you see?

Exercise 4

- Identify two CMEs with speeds approximately 1500 km/s, but near the east limb and the other near the west limb from the Type II burst catalog. Check the catalog to see the SEP intensities in the two cases. Check the SEP time profiles. Explain the differences if there are any.